

What is claimed is:

1. A system for carbonating a liquid with carbon dioxide gas, comprising:
  - 5 a pressurized source of carbon dioxide gas;
  - a user-operable three-way valve system having a first, a second, and a third orifice providing a first, a second and a third valve state, which in the first state connects the first orifice with the second orifice, in the second state connects the second orifice with the third orifice, and in the third state closes internal passage between all orifices, the valve system connected from
  - 10 the first orifice and a conduit to the pressurized source of carbon dioxide gas; and
  - a closure assembly having an interface to a nozzle of a container for liquid and an orifice connected through a conduit to the second orifice of the three way valve system;
  - characterized in that placing the three-way valve system in the first state admits carbon dioxide under pressure to the container, placing the three-way valve system in the second state
  - 15 connects the container for liquid to the third orifice of the three way valve system, allowing the container for liquid to de-pressurize, and placing the three-way valve system in the third state closes all passages between orifices.
2. The system of claim 1 wherein the three-way valve system comprises a single valve having
- 20 an internal rotary element for providing the three states.
3. The system of claim 2 wherein the internal rotary element is electrically powered, and the system further comprises a control panel with user inputs for initiating the states.
- 25 4. The system of claim 2 wherein the internal rotary element is manually-operable.

5. The system of claim 1 further comprising a pressure regulation apparatus attached to the pressurized source of carbon dioxide gas, and a shut-off valve at the pressure regulation apparatus.

5 6. The system of claim 1 further comprising a restricted orifice in the closure assembly, such that gas allowed to escape from the liquid container, escapes at a restricted rate.

7. The system of claim 1 further comprising a pedestal-bourne housing with the valve operable through a wall of the housing, and a nozzle through the housing connected to the third orifice of  
10 the three way valve.

8. The system of claim 1 wherein the closure assembly comprises a valve stem mounted through a threaded cap for the liquid container and an air-chuck connected to attaching to the valve stem and to the conduit to the second orifice of the three way valve.

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9. The system of claim 1 integrated with a water-cooler.

10. A method for carbonating a liquid, comprising the steps of:

(a) placing the liquid in a container leaving a volume of air over the liquid at one  
20 atmosphere pressure;

(b) pressurizing the volume of air over the liquid with carbon-dioxide gas to at least twice atmospheric pressure;

(c) releasing the pressure on the container back to one atmosphere, thereby reducing the mass of air in the volume over the liquid by at least a factor of two;

25 (d) re-pressurizing the volume with carbon dioxide gas; and

(e) agitating the container to entrain a portion of the gas in the volume over the liquid to within the liquid.

11. The method of claim 10 comprising a further step for releasing the pressure on the  
5 container, after the agitation step, back to one atmosphere.

12. The method of claim 11 wherein the final pressure release is accomplished through a restricted orifice to be slow enough to prevent frothing of the liquid.

10 13. The method of claim 10 wherein multiple pressurization and release steps are accomplished before the agitation step.

14. A closure assembly for assembling to a threaded nozzle of a container for liquid, comprising:

15       an interface threaded to engage the threaded nozzle;  
          a seal system for rendering the interface to the nozzle hermetically sealed; and  
          an adapter to a conduit for connecting the container to a source of pressurized gas.

15. The closure assembly of claim 14 wherein the adapter comprises a commercially available  
20 valve stem assembled to an especially adapted cap providing the interface threaded to engage the threaded nozzle.

16. The closure assembly of claim 15 further comprising a commercially available air chuck for connecting to the valve stem.

17. The closure assembly of claim 14 wherein the adapter comprises a proprietary combination valve stem and threaded interface, and the seal is a rubber washer between the combination valve stem and the nozzle.
- 5 18. The closure assembly of claim 14 wherein the adapter comprises a proprietary valve stem molded using rubber or other flexible material, the valve stem having a circular sealing wing positioned for sealing between the nozzle and a cap.